In the Claims

1 - 6 (Canceled)

7. (Currently Amended) An improved method for the decomposition of cumene hydroperoxide by acidic catalyst to phenol and acetone wherein the improvement comprises decomposing cumene hydroperoxide in a continuous, non-isothermal manner in a decomposition reactor using sulfuric acid as the acidic catalyst in the presence of cumene and excess acetone whereby the reactor composition includes 10 to 100 percent excess acetone relative to the amount of acetone produced during the reaction whereby the rate of decomposition of cumene hydroperoxide is reduced and the reaction is more controllable and more selective,

wherein a cumene oxidation product and an acetone recycle stream are pumped into the reactor,

the cumene oxidation product containing about 80 wt% cumene hydroperoxide (CHP), up to 5 wt% dimethylphenyl carbinol (DMPC) and acetophenone, the balance being mostly cumene, and

wherein the acetone solution contains alpha methyl styrene (AMS), phenol, cumene, about 1 to about 5 wt% water and up to about 0.05 wt% sulfuric acid,

wherein the cumene oxidation product feed stream and the acetone recycle stream are introduced into the decomposition reactor continuously at a ratio of about 7:1.

8 - 28 (Canceled)

29. (Currently Amended) An improved method for preparing phenol and acetone from the decomposition of cumene hydroperoxide with an acidic catalyst wherein the

improvement comprises (a) decomposing cumene hydroperoxide in the presence of cumene and at a specific catalyst concentration and temperature in a decomposition reactor whereby a composition comprising phenol, acetone and dicumyl peroxide is formed, (b) transferring the phenol, acetone and dicumyl peroxide composition to a plug flow reactor wherein decomposition of dicumyl peroxide to phenol, acetone and alphamethylstyrene occurs at a higher temperature than the temperature in step (a) whereby the dicumyl peroxide decomposition is better controlled,

wherein a cumene oxidation product feed stream and an acetone solution recycle stream are pumped into the decomposition reactor of step (a), wherein said cumene oxidation product contains about 80% cumene hydroperoxide (CHP), up to 5 wt% dimethylphenyl carbinol (DMPC) and acetophenone, the balance being mostly cumene; wherein said acetone solution contains alpha methyl styrene (AMS), phenol, cumene, about 1 to about 5 wt% water and up to about 0.05 wt% sulfuric acid; wherein said cumene oxidation product feed stream and acetone solution recycle stream are continuously introduced into said decomposition reactor of step (a) at a ratio of about 7:1.

30 - 35 (Canceled)

36. (Currently Amended) An improved method for the decomposition of cumene hydroperoxide to phenol and acetone wherein the improvement comprises decomposing cumene hydroperoxide in a non-isothermal manner in a decomposition reactor in the presence of cumene and 10 to 100 percent excess acetone relative to the amount produced during the reaction, and introducing additional water into the cumene hydroperoxide decomposition reactor,

wherein a cumene oxidation product feed stream and an acetone solution recycle stream are pumped into the decomposition reactor of step (a), wherein the cumene oxidation product contains about 80 wt% cumene hydroperoxide (CHP), up to 5 wt% dimethylphenyl carbinol (DMPC) and acetophenone, the balance being mostly cumene; wherein the acetone solution contains alpha methyl styrene (AMS), phenol, cumene, about 1 to about 5 wt% water and up to about 0.05 wt% sulfuric acid; wherein said cumene oxidation product feed stream and acetone solution recycle stream are continuously introduced into said decomposition reactor of step (a) at a ratio of about 7:1.

37 – 38 (Canceled)

39. (Currently Amended) A cumene hydroperoxide decomposition mass produced from the non-isothermal decomposition ~~reaction~~ of cumene hydroperoxide in a decomposition reactor with ~~an~~ a sulfuric acid catalyst~~, wherein the acid catalyst is sulfuric acid,~~ in a continuous manner having 10 to 100 percent excess acetone relative to the amount of acetone produced during the reaction and cumene,

wherein a cumene oxidation product feed stream and an acetone recycle stream are pumped into the decomposition reactor, wherein the cumene oxidation product contains about 80 wt% cumene hydroperoxide (CHP), up to about 5 wt% dimethylphenyl carbinol (DMPC) and acetophenone, the balance being mostly cumene; wherein the acetone solution contains alpha methyl styrene (AMS), phenol, cumene, about 1 to about 5 wt% water and up to about 0.05 wt% sulfuric acid; wherein the cumene oxidation product feed stream and acetone recycle stream are continuously introduced into the decomposition reactor at a ratio of about 7:1.

40 – 43 (Canceled)